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### REMARKS

By this paper, the specifications has been amended, Claims 3-5, 8 and 32 are cancelled and Claims 39-52 are added. Accordingly, Claims 1, 2, 6, 7, 9-31, and 33-52 are currently pending. In view of the above amendments and the following remarks, Applicant respectfully requested reconsideration of the claims.

#### Discussion Of Amendments To The Specification

In paragraph 2 of the Office Action, the Examiner objects to the drawings under 37 C.F.R. § 1.83(a) because they fail to show items as described in the specification. In particular, the "Examiner suggests applicant label items in Figs. 1 and 2 as referenced in specification." Accordingly, Applicant has amended the specification so that all reference numerals in Figures 1 and 2 correspond with reference numerals described in the specifications. Applicant notes that the reference numerals in Figure 1 are introduced in the specification at page 7, lines 22-30 and page 13, lines 2-26. Reference numerals in Figure 2 are introduced in the specification at page 8, lines 1-10 and page 13, line 27 to page 14 line 16. Applicant requests withdrawal of this objection.

In paragraph 3 of the Office Action, the Examiner objected to the disclosure because of various informalities. Applicant has amended the cited portions of the specification. Accordingly, Applicant requests withdrawal of these objections.

#### Discussion of Claim Rejections Under 35 U.S.C. §§ 102(b) and 103(a)

The present application generally describes a communication system that facilitates communication between a base station and multiple terminals. The base station advantageously includes two or more spatially diverse transmitting and/or receiving means, such as antennas.

In downlink communications, the base station transmits multiple data signals, each intended for a specific terminal, to multiple terminals. The base station first receives the multiple data signals that are to be transmitted to respective terminals. The data signals are combined to form two combined data signals that will each be respectively transmitted from one of the base stations antenna's . Thus, each of the spatially diverse antennas of the base station transmits a different combined data signal. The combined data signals are transmitted from the spatially diverse transmitting means so that the combined data signals combine in the air, forming a

different composite data signal at each of the terminals. The base station advantageously forms the combined data signals so that, based on the respective composite data signals received at each terminal, each terminal may estimate a data signal intended for the respective terminal. Thus, at least one of the terminals estimates a data signal without the use of a code for selecting a particular data signal from a received composite data signal. For further discussion, see page 5, line 25 to page 6, line 21; page 8, lines 1-10 and page 13, line 27 to page 14 line 16.

In uplink communications, multiple terminals transmit data to a base station. The base station, having a spatially diverse receiving means, receives a transmitted data signal from each of a plurality of terminals on at least two receiving means, such as antennas. The base station then uses the spatial signature, or the characteristics that are different in the signals received on each of the spatially diverse receiving means to determine which of the terminals transmitted each signal. In one embodiment, each signal is subdivided into multiple subbands for transmission on multiple subcarriers to the base station. The base station performs operations on the received signal in a carrier by carrier manner. More particularly, in operating on a particular subband of data, the base station does not use information regarding adjacent subbands. For further discussion, see page 7, lines 22-30 and page 13, lines 2-26.

#### Claims Directed Towards Downlink Communications

In paragraph 7 of the Office Action, the Examiner rejected Claims 17-20, 25, 33-36, and 38 under 35 U.S.C. § 102(b) as being anticipated by Julian (G.B. Patent No. 2 324 932 A). In view of the above amendments and the following remarks, Applicant respectfully requests reconsideration.

#### Claims 17 and 33

Independent Claims 17 and 33 are each directed to methods of transmitting data signals from a base station to multiple receiving terminals. Claims 17 and 33, as amended, each specify that two or more different combined data signals are adapted for facilitating estimation of data contained in the combined data signals by each of multiple receiving terminals, wherein the combined data signals combine in the air so that a composite data signal received by each of multiple terminals may be used to estimate a data signal intended for each respective terminal.

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Applicant respectfully submits that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference. *See* M.P.E.P. § 2131. Applicant respectfully submits that Julian does not expressly teach or suggest that two or more different combined data signals are adapted for facilitating estimation of data contained in the combined data signals by each of multiple receiving terminals, wherein the combined data signals are combined in the air so that a composite data signal received by each of multiple terminals may be used to estimate a data signal intended for each respective terminal. Furthermore, Applicant respectfully submits that Julian does not inherently describe these features. “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to support the determination that the inherent characteristic necessarily flows from the teachings of the applied prior art.” *See* M.P.E.P. § 2112. Applicant respectfully submits that system of Julian transmits subsets of sub-channels from different antennas that may be combined at the receiver to form a transmitted symbol. As described in further detail below, Applicant respectfully submits that since Julian does not teach or suggest each and every element of Claims 17 and 33 and, therefore, these claims are not anticipated and are in condition for allowance.

Julian is directed to a communication system comprising “a mobile unit 112 [that] transmits a composite signal comprising multiple sub-channels of modulated data. A plurality of spatially separated antennae 118, 120 at a base station 116 each receives the composite signal via *a different propagation path* 122, 124. Each composite signal received is decoded and quality metrics for the multiple sub-channels are assessed.” *Julian*, Abstract. Thus, Julian describes a single transmitter (112) that transmits a signal, comprising multiple sub-bands of data, to a single receiver (116) having multiple antennae (118, 120). Julian further recites, “[t]he present invention exploits the guard interval of the multicarrier system to allow the transmission of a subset of the sub-channels from each of the different and spatially separated antennas. These transmissions combine non-coherently ... at a single receiver to form a composite OFDM symbol.” *Id.*, p. 7, ll. 8-12. Accordingly, Julian transmits subsets of sub-channels from different antennas. The subsets may then be combined at the receiver to form a transmitted symbol.

In contrast, Claim 17, as amended, recites:

A method of transmitting data signals from a transmitting terminal having a spatially diverse transmitting means comprising at least two transmitting means to at least two receiving terminals, the method comprising ... determining at least

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two combined data signals in the transmitting terminal, the combined data signals each being transformed versions of the data signals, wherein the combined data signals are adapted for facilitating estimation of the data signals by the receiving terminals ... [and] transmitting one of the inverse subband processed combined data signals from each of the at least two transmitting means, wherein said inverse subband processed combined data signals form a different composite data signal at each of said at least two receiving terminals.

Similarly, Claim 33, as amended recites:

An apparatus for transmitting a plurality of data signals to a plurality of terminals, the apparatus comprising:

circuitry for combining a plurality of data signals to create two combined data signals, wherein the combined data signals are adapted for facilitating estimation of the data signals intended for each of a plurality receiving terminal at each receiving terminal ... at least two spatial diverse transmitting means configured to transmit respective inverse subband processed combined data signals to at least two receiving terminals, wherein said inverse subband processed combined data signals form a composite data signal at each of said plurality of terminals.

Accordingly, Claims 17 and 33, as amended, each recite the determination of data signals from a unique composite data signal, where the combined data signals are adapted for facilitating estimation of data signals at multiple receiving terminals. More particularly, due to the particular combining of the data signals in forming each of the combined data signals, each receiving terminal receives a different composite data signal that may be used to determine the data signal intended for the receiving terminal.

In contrast, Julian teaches communication from a single base station to a single receiving terminal. Thus, Julian fails to teach or suggest transmission of combined data signals to at least two receiving terminals. Furthermore, Julian fails to teach or suggest generation of combined data signals that are adapted for facilitating estimation of the data signals by two or more receiving terminals. Although Julian teaches the use of multiple antennas at a receiver, Julian fails to teach or suggest that transmitted signals combine in the air forming a composite data signal at each of said plurality of terminals. Because Julian fails to teach or suggest every element of Claims 17 and 33, Applicant asserts that Claims 17 and 33, as amended, are allowable over the cited art. Reconsideration of Claims 17 and 33 is respectfully requested.

Claims 18-27, 34-38, 43, and 45

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Claims 18-27, 34-38, 43, and 45 each depend from Claims 17 and 33, and are therefore believed to be in condition for allowance at least for the reasons discussed above with respect to Claims 17 and 33 and for their own patentable features. Reconsideration of Claims 18-27 and 34-38 is respectfully requested.

#### New Claims

Claims 46-49 have been added and are believed to be allowable over the cited art. Consideration of Claim 46-49 is respectfully requested.

#### Claims Directed Towards Uplink Communications

In paragraph 6 of the Office Action, the Examiner rejected Claims 1-4, 10, 13, 14, 16, and 28-32 under 35 U.S.C. § 102(b) as being anticipated by Agee (U.S. Patent No. 6,128,276). In paragraph 9 of the Office Action, the Examiner rejected Claims 5, 6, and 7-9 under 35 U.S.C. § 103(a) as being unpatentable over Agee as applied to Claim 1 in view of Chennakeshu (U.S. Patent No. 6,137,843). In view of the above amendments and the following remarks, Applicant respectfully requests reconsideration.

#### Claims 1 and 28

Independent Claims 1 and 28 are directed to a system and a method, respectively, of transmitting data signals from multiple terminals to a base station. Claims 1 and 28, as amended, each specify that estimates of the data signals are determined based on a subcarrier by subcarrier analysis of signals received by a spatial diversity means.

To establish a *prima facie* case of obviousness a three-prong test must be met. First, there must be some suggestion or motivation, either in the references or in the knowledge generally available among those of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success found in the prior art. Third, the prior art reference must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). As described in further detail below, none of the cited art, in any combination, teaches or suggests all of the limitations of Claims 1 and 28. Accordingly, Applicant respectfully submits that Claims 1 and 28 are in condition for allowance over the cited art.

Claims 1, as amended, includes features similar to those of cancelled Claims 3, 4, and 5. In rejecting cancelled Claim 5, the Examiner notes that Agee does not disclose the elements of Claim 5. *Office Action*, page 8. Accordingly, having amended Claim 1 to include features similar to those of cancelled Claim 5, Applicant asserts that Claim 1, as amended, is in condition for allowance over Agee. Furthermore, New Claim 39 includes features similar to those of cancelled Claim 5 and Applicant therefore asserts that Claim 39 is allowable over Agee. Applicant further asserts that the combination of Agee with Chennakeshu fails to teach or suggest every element of Claim 1, as amended, and Claim 39.

Chennakeshu is directed to a “multi-signal cancelling demodulator in which signals of interest are demodulated using information obtained during demodulation of adjacent signals.” *Chennakeshu*, Abstract (emphasis added). “By utilizing detected information in an across-channel fashion, exemplary cancelling demodulators provide superior adjacent channel interference rejection. ... In exemplary parallel demodulation embodiments, two channels are demodulated simultaneously in iterative fashion.” *Id.* Thus, Chennakeshu describes the use of multiple channels to determine each signal.

Claim 1, as amended, recites:

A method of transmitting data signals from at least two transmitting terminals, with each having at least one transmitting means, to at least one receiving terminal having a spatial diversity receiving means, the method comprising:

transmitting from the transmitting terminals transformed data signals, being transformed versions of respective data signals, wherein spectra of the transformed data signals are at least partly overlapping;

receiving on the spatial diversity means received data signals, wherein the received data signals are each a function of one of the transformed data signals;

subband processing of the received data signals in the receiving terminal;  
and

determining estimates of the respective data signals, on a subband by subband basis, from the subband processed received data signals in the receiving terminal, wherein said determining includes, for at least one data signal.

Similarly, Claim 28, as amended, recites “[a]n apparatus for determining estimates of data signals, the apparatus comprising: at least one spatial diversity receiving means comprising at least two receiving means; [and] circuitry for subband processing, on a subband by subband basis, the data signal received on each of the at least two receiving means.” Thus, Claims 1 and 28 each recite the estimation of data signals using a subband by subband analysis of received

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signals. Conversely, the system described in Chennakeshu utilizes adjacent signals in order to determine a particular signal. Accordingly, Chennakeshu does not teach or fairly suggest at least “determining estimates of the data signals, on a subband by subband basis ... [and] determining an estimate of the selected data signal from the subband processed received data signals,” as recited in Claim 1, as amended. Applicant respectfully asserts that Claims 1 and 28, as amended, are patentable over the cited art. Reconsideration of Claims 1 and 28 is respectfully requested.

#### Claims 2 and 6-16

Claims 2, 6, 7, and 9-16 each depend from Claim 1. Claims 29-31 each depend from Claim 28. Accordingly, these claims are believed to be in condition for allowance at least for the reasons discussed above with respect to Claims 1 and 28 and for their own patentable features. Reconsideration of Claims 2, 6, 7, 9-16, and 29-31 is respectfully requested.

#### New Claims

Claims 39-45 and 50-52 have been added and are believed to be allowable over the cited art. Consideration of Claims 39-45 and 50-52 is respectfully requested.

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Conclusion

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above amendments and remarks, reconsideration and withdrawal of the outstanding rejections is respectfully requested. If the Examiner has any questions which may be answered by telephone, he is invited to call the undersigned directly.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

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By: Russell M. Jeide  
Russell M. Jeide  
Registration No. 54,198  
Attorney of Record  
Customer No. 20,995  
(619) 235-8550

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